

Attachment #1
Rpt. Misc. - 35

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8 June 64

SUBJECT: Quarterly Review Conference - PAR 202 and PAR 224 - [REDACTED]

25X1

VISITOR [REDACTED]

FROM [REDACTED]

1. [REDACTED] is seriously ill and probably will be out for an extended period. PAR 202 has been reassigned to [REDACTED] PAR 224 was originally [REDACTED] responsibility.

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2. We gave [REDACTED] the 4th Quarter Reports, and I reported verbally our general thinking on the enlarger systems with the reservation that detail study might alter our plans.

3. Pertinent comments by [REDACTED] were:

a. Frame counting in the negative transport system is not desired in these two instruments. Our proposals for PAR 204 and 205 included this feature at [REDACTED] request, and I suggested it for 202 and 224.

[REDACTED] feels the operational gain does not warrant the added complexity of equipment.

b. Cut sheet print stock appears desirable for both instruments. This will require a future statement in our engineering reports since roll print stock was specifically described in our proposal on PAR 202.

c. Setting of lens focus to a "number" by hand, from a table relating lens focal length, magnification and platen setting appears satisfactory.

d. Do not abandon the concept of two machines. However, after the study, the division may be between black-and-white vs color rather than by magnification.

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Attachment #2
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11 June 64

SUBJECT: Quarterly Review Conference - FAR 203 - [REDACTED]

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VISITOR: [REDACTED]

FROM [REDACTED]

1. Customer gave verbal approval to proceed with FAR 203. This approval will be followed by a TWX which can be expected early next week.

2. Customer indicated that we investigate the use of the [REDACTED] diazo material reported at the International Conference of Photographic Science and Engineering. The paper was entitled "Continuous Tone High Resolution Diazo Reproduction System" (200 l/mm were reported).

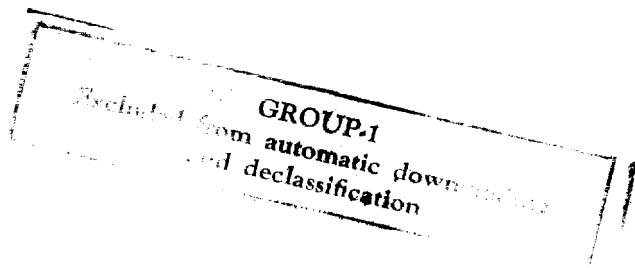
3. The customer is primarily interested in positive to positive print systems. Use of a negative positive system is acceptable if it provides a method to the positive prints.

4. The customer would like the capability to make exposures as film is moved over viewing table (light table).

5. Bi-mat materials were mentioned by [REDACTED] for possible use, but he was told that we did not feel Bi-mat as applicable to FAR 203 as for other investigations now underway.

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Attachment #3
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26 June 64

SUBJECT: Quarterly Review Conference, PARs 206 and 207 - [REDACTED]

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VISITORS: [REDACTED]

FROM [REDACTED]

1. Due to the anticipated prolonged illness of [REDACTED]
[REDACTED] has assumed responsibility for PARs 202, 206, 214 and 215.
In view of this, review of these PARs by [REDACTED] is in the form of getting acquainted with the program.

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2. PAR 206

a. [REDACTED] Contractor Engineer for PAR 206, was not available for discussion with [REDACTED] was informed that the Grafton processor had been modified for reversal processing tests. [REDACTED] was also informed that the only tests accomplished had been reversal by the re-exposure process. Tests show the contrast of the current reversal process for Type 8430 film results in a lower contrast reversal duplicate negative than in a corresponding third generation negative made from a duplicate positive.

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b. [REDACTED] indicated the customer had considerable interest in the sensitometric differences and performance characteristics of reversal film which are chemically reversed.

3. PAR 207: Review of PAR 207 was delayed pending approval of PAR 207A submitted to the customer on 21 Apr 64.

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Attachment #4
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11 June 64

SUBJECT: Quarterly Review Conference - PAR 209 - [REDACTED]

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VISITOR: [REDACTED]

FROM [REDACTED]

1. With regard to the Phosphor Viewer, PAR 209, the customer has not fully made up his mind as to value of this unit. He feels that if it were adapted with a microscope, it would be more usable. The light intensity is too low. The phosphor is too rough.

2. Any future development or investigation along this line should have:

- a. Brighter phosphor
- b. Smoother surface phosphor
- c. Accommodate a microscope
- d. Have longer range of brightness control on transmission intensity.

FUTURE ACTIVITY

5. Customer will continue evaluation and make recommendation to continue new development in this area or drop at this level.

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and declassification

Attachment #5
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11 June 64

SUBJECT: Quarterly Review Conference - PAR 211 - [REDACTED]

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VISITOR: [REDACTED]

FROM [REDACTED]

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1. [REDACTED] indicated that this PAR is being investigated in two parts. First, three standard aerial films are processed in standard processes and analyzed; and second, the developer chemistry is varied for the processing of the same films, and edge quality of the films is compared. [REDACTED] indicated agreement of this technique. He indicated his group had independently arrived at the same method for the approach to the problem. The late start on PAR 211 was attributed to the analysis effort involved in studying the approach to the problem.

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2. The major effort to date has been setting up processing equipment and establishing repeatable controlled processing standards. Two developer formulations which yield fine grain negatives and two developers which produce high sharpness are included in this investigation. The process gamma for these developers have been matched to aid in the investigation. Accutance and granularity exposures have been made and processed, however, to date these films have not been read out. A computer program to handle data reduction has been established. [REDACTED] requested inclusion of modulation transfer function measurements and AF tribar target exposures in our test program to permit MTF and resolution comparisons. [REDACTED] indicated that low-contrast resolution targets provided better data than high-contrast targets.

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3. [REDACTED] indicated that some scatter in the plotting of MTF data in preliminary tests had been observed. Part of the cause for this scatter is currently attributed to the read-out equipment. Improvements are being investigated. [REDACTED] explained a technique involving a coherent optical system which would provide MTF comparisons without the use of a microdensitometer.

4. [REDACTED] indicated that he would like to review and assist in preparing the specifications for the practical exposures which will be prepared for subjective analysis by trained P.I.'s (paragraph b, Phase II of PAR). He volunteered the services of a consultant trained in psychometric methods for this phase of the project.

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5. Activity in this PAR has been limited to studies of edge characteristics and developer composition. Work on Part 3, mensuration prints, will await a visit to the customer's shop for a briefing on equipment, processes and techniques used by the customer for mensuration, followed by a discussion on current deficiencies. agreed to make preparations for this visit.

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26 June 64

SUBJECT: Quarterly Review Conference - PAR 212 - [REDACTED]

25X1

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VISITOR: [REDACTED]

25X1
FROM [REDACTED]

25X1 [REDACTED] answered questions concerning terminology contained in the quarterly report.

1. Contrast: High and low contrast were defined as $>10:1$ and $1.6:1$ respectively.

2. Haze Effect Versus Altitude: The effects of haze versus altitude as demonstrated by recent low altitude flights (12000 to 16000 feet) indicate insufficient attenuation at these altitudes to simulate high altitude effects. At 50,000 feet or above, we can expect less dependency on weather effects and variations in scene luminance. We know that a 4:1 ratio to be real from black and white acquisition. We further indicated that sensitivity in the blue layer is most affected by haze and there are three (3) possible approaches for correction.

- a. Orientation of effort to the acquisition film.
- b. Orientation of effort to the duplicating film.
- c. Orientation of partial effort to each product.

3. At this time, we must use currently available emulsions having a single blue layer with multiple sensitizers, rather than multiple blue layer materials. It was pointed out that the latter introduces emulsion design problems. Thus we must adjust color balance primarily in the duplicating stage.

4. It was stressed to both visitors that we need at an early date some high altitude color acquisition in order to answer current questions and for predicting results. Until this is achieved, we do not have a complete story on materials. [REDACTED] added that specifications for low altitude (up to 5,000 feet) and medium altitude (above 5,000 to 50,000 feet) were also of interest and needed.

5. Color Negative Materials: As a result of customer interest in color negative materials for acquisition, it was indicated that reversal materials were preferable because of better definition/resolution capabilities. The

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characteristics of SO-121 were used as an example.

6. Programmed Exposure: We indicated that programmed acquisition exposure is hoped for but cannot be fully relied upon to answer all scene by scene problems. A need will always be for an acquisition material with good exposure latitude characteristics. Wedge filter and wedge density correction (gyro mounted) during acquisition, or in printing, was discussed for oblique angle "takes" since conditions may vary significantly for oblique angle "takes" on the right, versus the left. We indicated that frame-by-frame processing is not a practical approach now.

7. Project Aims: It was generally agreed that we are not primarily interested in a true color original film and that the emphasis is still on the color duplicate transparency. The first generation was defined as the camera original. We further indicated that current aims were toward the retention of color fidelity within the system instead of the super-high resolution now obtainable with current black-and-white systems.

8. Project Needs and Considerations:

a. We proposed to the visitors that we provide a list of specifications for acquisition films to serve as an equipment limitations guide. This might also serve to close the customer's time gap from a new acquisition system to the availability of the equipment to handle it. The visitors indicated the need for negative information also to prevent waste of time on dead-end approaches.

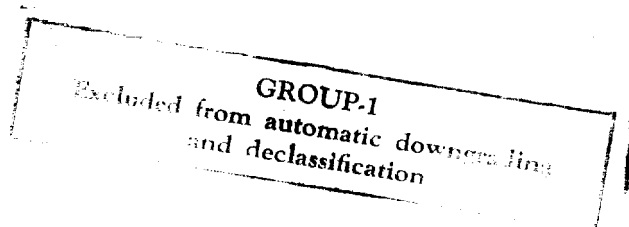
b. The visitors indicated interest in a variable color viewer capability including variable contrast. It was concluded that the degradation in resolution by current optical-electronic devices (TV approach) currently ruled out the usefulness of such a device. However, if, and when an optical-electronic device approaching high resolution as compared to the present cathode ray tube is a possibility it would be of interest to them.

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2 July 64

SUBJECT: Quarterly Review Conference - PAR 213 - [REDACTED]

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25X1 VISITOR: [REDACTED]

25X1 FROM [REDACTED]

25X1 1. [REDACTED] indicated interest as to the approach taken in order to meet the requirements of this PAR.

2. Approach:

25X1 a. [REDACTED] took up the discussion and indicated we actually deal with two (2) problems in this PAR, acquisition and duplication. In effect, factors of the acquisition phase limit our choice of duplicating systems.

b. Scene luminance ratios have been observed ranging from 18:1 to 30:1 at an altitude of 12,000 feet. At ascending altitudes above 50,000 feet, the luminance ratio is known to be reduced to as low as 4:1 from black-and-white systems. This 4:1 ratio related to the apparent brightness as the camera sees it. Haze effects and color balance shifts with higher altitudes require changes in the film types used. Thus the luminance range in a transparency for a given scene on the ground would be dependent on the duplicating material and the process used. These factors are all inter-related.

3. Kodachrome Example:

a. On this subject, it was indicated that scenes at a 4:1 luminance ratio produce originals at 8:1 and duplicates at approximately 18:1 when the duplicating film has a process contrast of 2.60.

b. At 12,000 feet, 30:1 is a representative maximum. This would cover the water surface type of scene where the luminance goes from almost black to specular light. At 50,000 feet or higher, 98 percent of the scenes might be about 4:1 or less. Some scenes at this altitude, depending on subject might approach 18:1.

4. Color Film 6513 (Acquisition) - Information given on this material was as follows: This material is a reversal type film on thin base with incorporated couplers. A higher than normal scene range might cause it to appear somewhat high in contrast. However, this characteristic does tend

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to minimize the haze effect. It has not been flown at high altitudes. The average contrast of 6513 is approximately 2.70. However, this figure is not usable in evaluation; the contrast for each layer is required. We use the terms gamma and average gradient in our evaluation: Gradient (between densities of 1.00 and 2.00) is more realistic for color because the middle portion of the curve has a much shorter straight line portion than black-and-white films.

5. Color Film SO-121 (Acquisition): The best acquisition film to date is SO-121, a reversal material with incorporated couplers. It is equal to or better than Kodachrome II. Resolution in terms of $>10:1$ and $1.6:1$ contrast is 151 and 76 lines per millimeter respectively. This material was only recently available and has not been flown above 12,000 feet. It can be successfully duplicated back on to itself if high contrast can be tolerated. We are currently arranging for flights in excess of 50,000 feet. We are now in a basic study of high altitude acquisition in order to make a firm selection of duplicating materials and processes.

6. General Comments on Color:

a. We are now getting the best color rendition possible; not "true" color. The major emphasis is on the second generation transparency.

b. PITA will give special consideration to "false" color for special applications, but the major effort is for a good general use material.

c. We believe color is better than black and white in several ways and want to prove this by making all of the duplicate transparencies, prints and enlargements etc., which will demonstrate its advantages. No one product will do everything we would like; and so far as resolution is concerned, we can improve but will never attain in color the resolution capabilities of black and white.

7. Variable Color Viewer:

a. We are considering the feasibility of a variable brightness but constant color temperature viewing light source with the additional capability of variable color. This is considered superior to the Kinescope approach.

b. requested that we make up 20 inches by 24 inches briefing boards for demonstration to his people. He would also like

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3 1/4 inches by 4 inches slide transparencies and some enlargements (transparencies) not larger than 9 inches by 9 inches. We agreed to do this, however, we believe this effort should be deferred until better high altitude photography is available from which to make the reproductions.

8. Presentation of Duplicate Transparencies and Reflection Prints:
Demonstration material shown consisted of the following combinations:

a. High Definition Color Film (CF-6513) (Incorporated Couplers):
This material was flown at medium altitude (12,000) and was shown in duplicate transparencies (Stereo Pairs).

(1) Three scenes of stereo pairs were selected for further generation effort even though the original material was underexposed by approximately 1.3 camera stops.

(2) The original positive color transparencies were difficult to print, but this was considered as being a condition likely to be encountered in an operational mission.

(3) The same scenes were printed onto ☐ Special Color Duplicating Film, SO-271. The sizes were 1:1, 5X, 10X and 19X. The quality was considered only fair because of the wide scene latitude resulting in reproductions of high contrast. Resolution was good for all sizes except the 1:1 transparency.

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(4) Color transparencies 1:1 were also contact printed onto Ektachrome Commercial Film, Type 7255. The resulting quality was excellent for color balance and definition but this material may be too low in contrast for scenes of narrow latitude.

(5) Reflection print enlargements (5X, 10X and 20X) were produced on ☐ Ektachrome paper. The resulting quality was considered unacceptable because of poor color balance and lack of color fidelity.

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(6) The same originals enlarged 5X onto ☐ Ektacolor Internegative Film, Type 6110, then enlarged 1, 2 and 4X onto Ektacolor Professional paper show considerable promise. The results were judged as excellent.

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b. High Definition Aerial Film, Type SO-121 (Incorporated Couplers): Acquisition during late spring, altitude 12,000 feet. Areas similar to those photographed on CF-6513 were selected for further study of duplicating methods.

(1) These scenes were contact printed onto Type 7255, SO-121 and Kodachrome II, Type 5029. High contrast was evident in the SO-121 and 5029 transparencies. The high contrast may be desirable for high-altitude scenes of short latitude. The type 7255 transparencies were excellent for color balance. The best resolution was seen in the 5029 reproductions.

(2) The same scenes were demonstrated through the Type 6110 Internegative-Ektacolor Professional paper system as 5X, 10X and 20X reflection prints. The quality was excellent and demonstrated the effect of shutter speed variations within a single frame.

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Attachment #8
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Subject: Quarterly Review Conference - PAR 214 and PAR 215 - [REDACTED]

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VISITOR: [REDACTED]

25X1
FROM [REDACTED]

1. PAR 214, Roller Transport Reversal Processor (12-inch)

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a. A general assembly of the machine as planned was shown to [REDACTED]. He indicated that he was in accord with our design approach and no changes in our design concept were required. Spec. No. 203 included in the Quarterly Report for the second quarter of FY-64 was reviewed.

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b. [REDACTED] questioned the advisability mixing heated and chilled water for temperature control and wondered if it were not possible to reuse the hot and cold water. He was told that the system we are proposing is similar to a system using a thermostatic mixing valve such as the Powers Model HVE, but that the control would be more precise. He was also told that in order to reuse the hot and cold water a closed loop system would be required and would require additional funding. He asked that we reconsider the temperature control problems and make recommendations based on installation costs, operating costs and their present facilities for heating and cooling water.

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c. [REDACTED] stated that he believed their electrical service was 120/208 volt, 3-phase, 4-wire, but was not sure. For the present, we will assume that it is 3-phase, 4-wire, 120/208-volt; however, this must be confirmed or corrected as soon as possible (action by [REDACTED]). This information is urgently needed in order to proceed with the design of the machine.

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2. PAR 215 - Roller Transport Processor (24-inch)

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a. [REDACTED] indicated that there was no requirement for the 24-inch processor to handle continuous strip material. All material processed will be chips printed on cut-sheet and most of the material will be on standard paper base. Some waterproof paper material and occasionally print film will be processed. He requested that the machine be designed for cut-sheet operation only, that the cassette feed be eliminated and the wind-up stand be eliminated but that provision be made to add the wind-up stand at a later time if desirable.

b. Confirmation of this change will be needed immediately in order to proceed with the design (action [REDACTED])

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Attachment #9
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8 June 64

SUBJECT: Quarterly Review Conference - PAR 216 and PAR 217 - [REDACTED]

25X1

VISITOR: [REDACTED]

FROM [REDACTED]

1. [REDACTED] read the complete quarterly report prepared by [REDACTED] on the two projects, which we summarized in our report to the customer. [REDACTED] would like a copy of the full report.

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2. [REDACTED] were shown the laboratory at HE where this work is being done by [REDACTED]

3. [REDACTED] seemed satisfied with the work done to date on the projects upon the bases that it is qualitative exploration and is a necessary educational period. The capability of the laser to produce high radiation energy concentration is a source of many technological surprises. One does not dare make assumptions about the use of the laser, hence many necessary experiments may appear trivial at first consideration.

4. In PAR 216, we must keep in mind the customer's interest in learning the inter-relationships of photographic films and laser radiation. No lasers other than He-Ne(6328A) should be considered here to avoid including too many variables in the experiments.

5. In PAR 217, no photographic tests are required until later.

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Attachment #10
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11 June 64

SUBJECT: Quarterly Review Conference - PAR 222 [REDACTED]

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VISITOR: [REDACTED]

FROM [REDACTED]

1. Our activities and developments on the Stereo Registration, PAR 222 to this date were reviewed with the customer.

2. The principle chosen for the breadboard was explained and drawings of the mechanical optical breadboard were reviewed. Photographs of scope traces obtained were presented.

3. The present breadboard uses yellow light for operator viewing and blue light for the scan signal working into electronic logic.

4. The customer stated that the manual operators preferred to view by blue light rather than the yellow now contemplated for the breadboard.

5. We will look into the possibility of changing the filters so that more of the blue region of the spectrum is used for viewing.

FUTURE ACTIVITY

6. We are scheduled to have the breadboard completed about the middle of July and customer will probably review again in August.

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Attachment #11

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SUBJECT: Quarterly Review Conference - PAR 225 - [REDACTED]

25X1

VISITOR: [REDACTED]

FROM [REDACTED]

1. The discussions were limited to three general topics:

- a. Trainee information and scheduling.
- b. Training program organization.
- c. Types and features of Micro-D equipment.

2. Training information and scheduling: [REDACTED] confirmed the following trainee schedule:

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- a. Five (5) trainees 27 through 31 July 64
- b. Three (3) trainees 3 through 7 Aug 64
- c. Five (5) trainees 10 through 14 Aug 64

Suitable clearances will be provided for the trainees involved.

3. [REDACTED] advised that the background or origin of these students to be:

- a. Eight (8) From film evaluation
- b. Three (3) From R & D
- c. One (1) From processing
- d. One (1) Unknown at this time.

4. Training Program Organization:

a. [REDACTED] indicated the ideal class size is four (4) to five (5) trainees. Fewer students tend to make the training inefficient. If cancellations drop the class size to less than three trainees, it might be wise to defer the program for a week or two. PITA would prefer a spread in the scheduling but has no objection to consecutive weeks.

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b. The instruction will begin with basics and then branch out from there into detailed instructions and operation. Four days will be planned for with the first three days covering formal instruction. The fourth day will provide for group discussion of specific problems. It appears the need for a fifth day would be unlikely. The trainees need no instructional material or supplies.

25X1 c. [] indicated the desire for summary information for each student to take away with him.

5. Types and Features of Microdensitometer Equipment: We are currently using only the one Model 5 Microdensitometer with magnetic coupler. There are no problems with the instrument if it is properly operated. This is what we intend to teach to avoid the violent vibrations that result from poor adjustments. Good techniques for locating the image on the stage plate can be shown and used on other equipment (e.g., the Model 3).

25X1 6. General: [] indicated a few features desirable for his people, as they use them.

a. Attachments to handle roll film.

b. The capability for both S and Y travel, 360° rotation and correctability for slant.

c. Ability to take a photomicrograph while scanning.

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Attachment #12
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30 June 64

SUBJECT: Quarterly Review Conference - PAR 226 - [REDACTED]

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VISITOR: [REDACTED]

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1. The status of this PAR was reviewed. It was indicated that edge data on Missions 1004-1, 1004-2, 4005, 4006, and 4007 were accomplished under this PAR, and that currently this work was being done under another contract.

2. [REDACTED] requested that copies of the "Summary of Microdensitometer Derived Image Quality Data" on the above missions as well as future missions be sent to him directly. Currently, the time lag in receiving information is excessive. (Note: Authorization to send reports was approved; copies of all previous missions have been sent.)

3. [REDACTED] indicated that his people selected most of the edges that had been scanned. The criteria for selection of edges is quite critical. In the past, the customer representatives have provided some limited inputs in the selection of edges for tracing. [REDACTED] suggested that [REDACTED] and the customer representatives coordinate in the selection of edges for tracing. [REDACTED] will relay information to the customer representatives who visit this facility.

4. [REDACTED] expressed satisfaction with the Microdensitometer Edge Trace data and indicated that these data correlate well with the MIP rating.

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AUTHORITY: [REDACTED]
DATE: [REDACTED]